CLAIMS:

1.   A magnetic resonance imaging apparatus comprising:

-         an RF coil system comprising M RF coils for detecting RF signals from a
region of interest, M being an integer larger than 2; and

-         N receiver channels for receiving and processing the detected RF signals, N
being an integer larger than 1 and smaller than M, characterized in that at least two RF coils
are combined for reception of RF signals of said RF coils with a single receiver channel,
wherein said at least two RF coils are selected so as to provide maximum spatially varying
coil sensitivities along the principal axis for coil sensitivity encoding.

2.   A magnetic resonance imaging apparatus as claimed in claim 1, characterized
in that pairs of two RF coils are each combined and connected to a separate receiver channel,
wherein at least one RF coil is not combined with any other RF coil.

3.   A magnetic resonance imaging apparatus as claimed in claim 1, characterized
in that said RF coil system comprises 8 RF coils, wherein 6 receiver channels are provided
and wherein pairs of two RF coils are each combined for reception of RF signals of said pairs
of RF coils with two separate receiver channels, respectively.

4.   A magnetic resonance imaging apparatus as claimed in claim 3, characterized
in that said 8 RF coils are arranged in the shape of a ring, in particular forming a birdcage
head coil arrangement.

5.   A magnetic resonance imaging apparatus as claimed in claim 3, characterized
in that pairs of two RF coils are each combined, which are arranged obliquely to the principal
axes for sensitivity encoding, in particular the anterior-posterior and left-right axes.

6.   A magnetic resonance imaging apparatus as claimed in claim 5, characterized
in that the RF coils of a first pair are arranged parallel to each other and the RF coils of a

second pair are arranged parallel to each other and orthogonally to the RF coils of the first pair.

7.   A magnetic resonance imaging apparatus as claimed in claim 5, characterized
in that the RF coils of a first pair are arranged orthogonally to each other and the RF coils of a second pair are arranged orthogonally to each other, wherein each of said RF coils of the second pair is arranged parallel to one RF coil of the first pair.

8.   A magnetic resonance imaging apparatus as claimed in claim 3, characterized
in that the RF coils of a first pair are arranged parallel to the principal axis for sensitivity encoding and the RF coils of a second pair are arranged obliquely to the principal axis for sensitivity encoding.

9.   A magnetic resonance imaging apparatus as claimed in claim 8, characterized
in that the RF coils of said first or said second pair, respectively, are juxtaposed.

10.   A magnetic resonance imaging apparatus as claimed in claim 8, characterized
in that the RF coils of said first or said second pair, respectively, are parallel to each other.

11.   A magnetic resonance imaging method comprising the steps of:
-              detecting RF signals from a region of interest using an RF coil system
comprising M RF coils, M being an integer larger than 2; and
-              receiving and processing the detected RF signals using N receiver channels, N
being an integer larger than 1 and smaller than M; characterized in that at least two RF coils
are combined for reception of RF signals of said RF coils with a single receiver channel,
wherein said at least two RF coils are selected so as to provide maximum spatially varying
coil sensitivities along the principal axis for coil sensitivity encoding.